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The Dawn of Reason, or Mental Traits in the Lower Animals. By JAMES WEIR, M. D. New York, The Macmillan Co. Pp. xiii+234. Price, \$1.25.

Dr. Weir has evidently been a close observer of animal life for many years, and his zeal has given him wider opportunities for useful observation than most amateurs and many professional naturalists have had. His book contains the more important of his own original observations of the intelligent activities of animals, some interesting verifications of the results gained by other observers, and his opinions about the nature of animal consciousness. Everything is purposely put in as simple language as possible, and this perhaps is a sufficient reason for the utter neglect of many observations, experiments and opinions which oppose his views. Lloyd Morgan, for instance, is nowhere mentioned, not even in the bibliography.

The popular nature of Dr. Weir's exposition prevents any discussion here of his observations on the morphology of the sense-organs of various animals, *e. g.*, jelly-fish, grasshoppers, beetles. He finds the marginal bodies of jelly-fish to be visual, not auditory organs, locates the auditory organs of grasshoppers in the anterior pair of legs, finds those of the Diptera to be the 'balancers' of Bolles Lee, and those of the *Cerambyx* beetle to be in the maxillary palpi. It would certainly seem worth while for Dr. Weir to present his data in complete form soon, so that those competent may judge of the soundness of his conclusions. He gives no drawings.

One cannot help lamenting the mental attitude which served as the inspiration to Dr. Weir's observations of the intelligent activities of animals. He craves a high development of mentality for the animals and has his eyes open only to possible evidence of it. He likes to find keen senses better than dull ones, reasons more than instincts, knowledge than ignorance. He psychologizes about animals as a lover might psychologize about his beloved. The disadvantages are obvious. On the other hand, there are some advantages, at least in the enthusiasm and patient labor which perhaps are due to the eulogizing temper. Anyone inter-

ested in the progress of comparative psychology must wish well to a man who, without the incentives of the professed naturalist, makes it a labor of love to watch animal life. I, for one, shall welcome such observations, even though they are more one-sided than Dr. Weir's. His favoritism toward animals, though it has deprived us of any records of unintelligent conduct and perhaps prevented the repetition of some tests and even distorted facts, has still failed to injure a very considerable number of suggestive and important observations. It will pay any student of animal psychology to read the book for the sake of these. They furnish interesting, and we hope reliable, data about the adaptive reactions of micro-organisms, the formation by insects of new associations in response to new situations, the formation by reptiles of habits due to the association of novel sights and sounds with certain reactions, about 'play' among insects, strange 'friendships' between animals, letisimulation, the activities of the harvesting ants, etc. A sample of Dr. Weir's keenness is his theory that the continual barking of dogs at night is explainable by the supposition that they bark at an echo. This hypothesis he supports by some very striking facts.

Of Dr. Weir's opinions about the meaning of his facts there is little to be said. His mind does not move freely and surely among psychological terms or theories or deductions. Reason means for him the source of all performances above the level of instinct, and his only basis of discrimination is the difference between high and low. His only theoretical problem is as to whether or not the human mind has developed from the brute mind. It will be a birthday for animal psychology when naturalists realize that this is among the least of its problems.

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SCIENTIFIC JOURNALS AND ARTICLES.

THE December number of the *Bulletin of the American Mathematical Society* contains an account of the October meeting of the Society, by the Secretary, Professor F. N. Cole; 'Concerning a Linear Homogeneous Group in $C_{m,q}$ Variables Isomorphic to the General Linear